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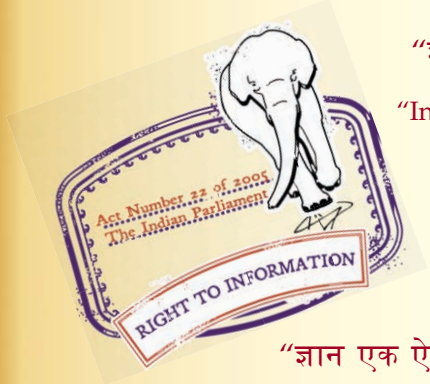
IS 1177 (1996): Oil of Vetiver (Cultivated and Khus) [PCD 18: Natural and Synthetic Fragrance Materials]



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"Knowledge is such a treasure which cannot be stolen"

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IS 1177 : 1996
REAFFIRMED
Jan 2

भारतीय मानक

वेटिवर (बोया हुआ और जंगली) का तेल — विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

OIL OF VETIVER (CULTIVATED AND *KHUS*) — SPECIFICATION

(Second Revision)

ICS 71.100.70

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 1996

Price Group 3

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Natural and Synthetic Perfumery Materials Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

Two Indian Standards on vetiver oil namely IS 1177 : 1957 'Vetiver (*KHUS*) oil' and IS 1614 : 1960 'Oil of vetiver roots (cultivated)' which were amalgamated in 1969 as both the products were obtained from taxonomically same plant source. Since 1969, the production of both these oils had reduced resulting in a change of the physico-chemical characteristics. This standard has been reviewed to incorporate the characteristics of the oils presently in vogue. In this revision, the requirements of refractive index, relative density, acid value, ester value, ester value after acetylation and total alcohol content have been modified. A new requirement of free alcohol has been added. GC method of analysis has been incorporated in this revision for the purpose of guidance only under Annex A.

KHUS plant, *Vetiveria zizanioides* (Linn.), Nash, fam. Gramineae occurs wild in several parts of India and its roots have long been used in incense and perfumes. The plant derives its name from the Tamil name 'vetiver'. The plant is also being cultivated in India, principally in the Southern part. To avoid possible confusion between the oil produced from wild vetiver or *KHUS* and the oil produced from cultivated vetiver, the former is called Oil of Vetiver (*KHUS*) while the latter is called Oil of Vetiver (Cultivated).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 DECEMBER 1998
TO
IS 1177 : 1996 OIL OF VETIVER (CULTIVATED AND *KHUS*) — SPECIFICATION

(Second Revision)

[*Page* 2, *Table* 1, *Sl No.* (iv), *col* 3 *and* 4] — Substitute '1.513 2-1.524 2' for the existing.

(PCD 18)

Reprography Unit, BIS, New Delhi, India.

Indian Standard

OIL OF VETIVER (CULTIVATED AND *KHUS*) — SPECIFICATION

(Second Revision)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and tests for oil of vetiver (cultivated and *KHUS*). The essential oil is used by the soap, perfumery and cosmetics industries. It is also used as a flavouring agent.

2 NORMATIVE REFERENCES

The following Indian Standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication the editions indicated were valid. All standards are subject to revision, and parties to agreements based on the standard are encouraged to investigate the possibility of applying the most recent editions of the standard indicated below:

IS No.	*Title*
326	Methods of sampling and test for natural and synthetic perfumery materials:
(Part 1) : 1984	Sampling (*second revision*)
(Part 2) : 1980	Preliminary examina-tion of perfumery materials and samples (*second revision*)
(Part 3) : 1980	Relative density (*second revision*)
(Part 4) : 1980	Determination of optical rotation (*second revision*)
(Part 5) : 1986	Determination of refractive index (*second revision*)
(Part 6) : 1986	Determination of solubility (*second revision*)
(Part 7) : 1980	Determination of acid value (*second revision*)
(Part 8) : 1980	Determination of ester value, content of esters and combined alcohols (*second revision*)
(Part 9) : 1980	Determination of ester value after acetylation and free alcohols (*second revision*)
(Part 11) : 1986	Determination of carbonyl value and content of carbonyl compounds (*second revision*)
1070 : 1992	Water for general laboratory use (*third revision*)
2284 : 1988	Methods for olfactory assessment of natural and synthetic perfumery materials (*first revision*)
6597 : 1988	Glossary of terms relating to natural and synthetic perfumery materials (*first revision*)

3 TERMINOLOGY

For the purpose of this standard, definitions given in IS 6597 : 1988 shall apply.

4 TYPES

There shall be two types of the material, namely:

Type 1 — Oil of vetiver (cultivated), and

Type 2 — Oil of vetiver (*KHUS*)

5 REQUIREMENTS

5.1 Description

5.1.1 Oil of vetiver (cultivated and *KHUS*) shall be obtained by steam or hydro-distillation of clean and fresh or air-dry roots of cultivated plant or roots of vetiver growing wild, both belonging to the plant source *Vetiveria zizanioides* (Linn.), Nash, fam. Gramineae.

5.1.2 The oil shall be a clear liquid, free from sediment, suspended matter, separated water and adulterants.

5.1.3 The oil shall be examined for its colour, clarity, separated water, by-notes and sediment as prescribed in IS 326 (Part 2) : 1980.

5.2 The material shall also comply with the requirements given in Table 1.

6 SAMPLING

6.1 Representative samples of the material, each sample containing not less than 50 ml, shall be drawn

as prescribed under IS 326 (Part 1) : 1984.

6.2 Number of Tests

Tests for the determination of all the characteristics shall be conducted on the composite sample.

6.3 Criteria for Conformity

The lot shall be considered as conforming to the specification if the composite sample satisfies all the requirements specified in **5** and Table 1.

7 PACKING AND MARKING

7.1 The material shall be supplied in well-closed containers as agreed to between the purchaser and the supplier.

7.2 The place of origin of the material shall be marked on each container.

7.3 The material shall be protected from light and stored in a cool place.

7.4 The containers may also be marked with the Standard Mark.

7.4.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8 TEST METHODS

8.1 Tests shall be conducted as prescribed in **5.1.3** and col 5 of Table 1.

8.2 Quality of Reagents

Unless specified otherwise pure chemicals and distilled water (*see* IS 1070 : 1992) shall be used.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

Table 1 Physico-Chemical Characteristics of Oil of Vetiver

(*Clause* 5.2)

Sl No.	Characteristics	Oil of Vetiver (Cultivated)	Oil of Vetiver (*KHUS*)	Ref to the Test Method
(1)	(2)	(3)	(4)	(5)
i)	Appearance and colour	Brown to reddish brown viscous liquid	Brown to reddish brown sometimes greenish viscous liquid	IS 326 (Part 2) : 1980
ii)	Odour	Characteristic and persistent woody aroma	Characteristic and persistent woody, balsamic aroma	IS 2284 : 1988
iii)	Relative density at 27°C	0.985-1.020	0.985-1.010	IS 326 (Part 3) : 1980
iv)	Refractive index at 27°C	1.515-1.525	1.510-1.520	IS 326 (Part 5) : 1986
v)	Optical rotation, D	+15° to 35°	−25° to −10°	IS 326 (Part 4) : 1980
vi)	Acid value, *Max*	35	30	IS 326 (Part 7) : 1980
vii)	Ester value	5 - 16	8 - 25	IS 326 (Part 8) : 1980
viii)	Ester value after acetylation	110 - 165	124 - 195	IS 326 (Part 9) : 1980
ix)	Free alcohols, percent, *Min*	30	45	IS 326 (Part 9) : 1980
x)	Combined alcohols, percent	8 - 25	3 - 10	IS 326 (Part 8) : 1980
xi)	Total alcohol (*Max* wt 220), percent, *Min* (ix + x)	46	52	—
xii)	Carbonyl value (percent, ketones, Mol wt 218)	23-68 (9-26.5 percent)	16-62 (6-24 percent)	IS 326 (Part 11) : 1980
xiii)	Miscibility in 80 percent *(V/V)* ethanol (vols)	1-2 vols slight opalescence may appear sometimes	1-2 vols clear	IS 326 (Part 6) : 1986

ANNEX A

(Foreword)

CAPILLARY GAS CHROMATOGRAPHIC ANALYSIS OF OIL OF VETIVER

A-0 GENERAL

A-0.1 The chromatographic conditions given here are for guidance only.

A-0.2 Outline of the Method

A sample of the material is dissolved in a suitable solvent (for example, acetone, cyclohexane, n-hexane) and is injected into the capillary gas chromatograph where it is carried by the carrier gas from one end of the column to the other. During its movement, the constituents of the sample undergo distribution at different rates and ultimately get separate from one another. The separated constituents emerge from the detector end of the column one after another and are detected by suitable means whose response is related to the amount of a specific component leaving the column. The detector signals, on transmission to the recorder plots the chart. From the specific area under various peaks corresponding to the specific constituent the quantities of different constituents are determined with the help of suitable electronic integrator.

A-1 APPARATUS

A-1.1 Any suitable capillary gas chromatograph and column (non polar) capable of being operated under conditions suitable for resolving the individual constituents into distinct peaks may be used. The typical chromatograms for oils of vetiver ('cultivated' and '*KHUS*') with the following chromatographic conditions are shown in Fig. 1 and 2.

Sample size	1 µl of 20% solution of oil of vetiver in acetone
Capillary column:	
Material	Methyl silicone
Length	50 m
Internal diameter	0.25 mm
Film thickness	0.25 µm
Carrier gas	Nitrogen (1 ml/min)
Flow split ratio	1 : 100
Injection temperature	250°C
Detector:	
Type	Flame ionization detector
Temperature	250°C

Oven Temperature Programming:

Methyl silicone capillary column

Temperature 1	120°C
Ramp 1	4°C/min
Temperature 2	180°C
Ramp 2	0.3°C/min
Temperature 3	181°C
Ramp 3	4°C/min
Temperature 4	200°C
Isothermal	10 min

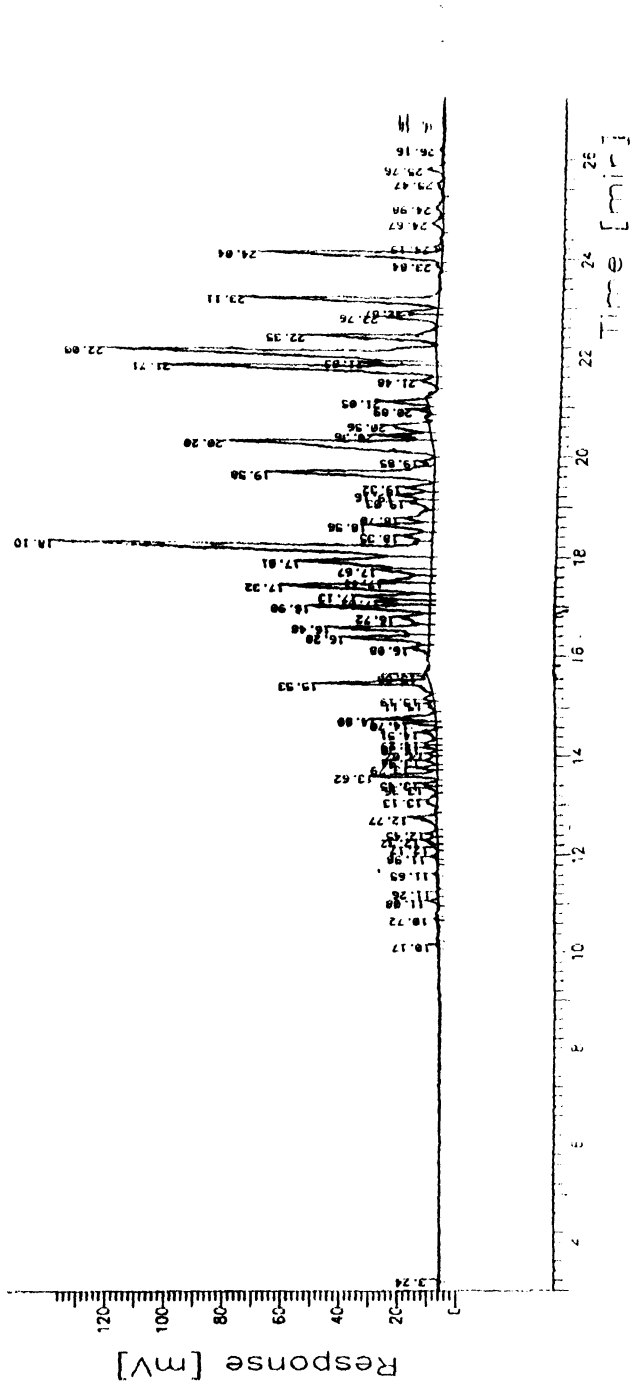

FIG. 1 A TYPICAL CHROMATOGRAM FOR OIL OF VETIVER (*KHUS*)

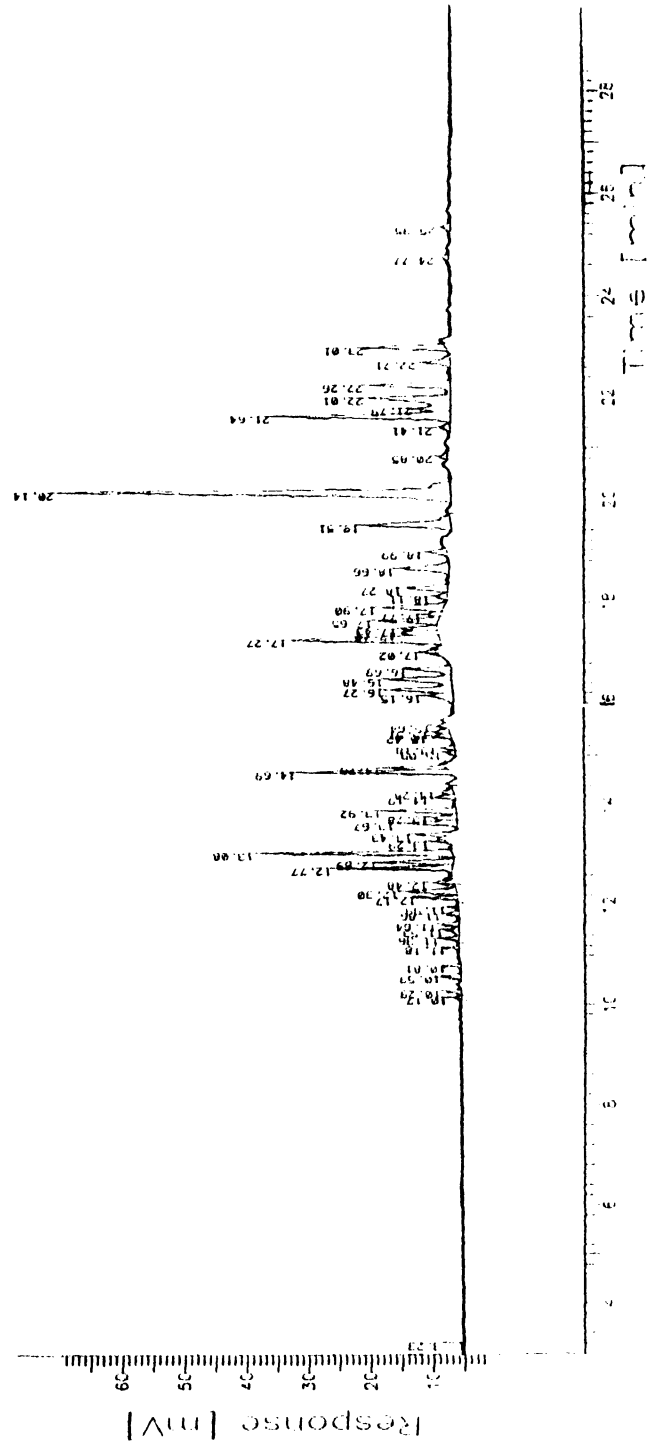

FIG. 2 A TYPICAL CHROMATOGRAM FOR OIL OF VETIVER (CULTIVATED)

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This Indian Standard has been developed from Doc : No. PCD 18 (1357).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Printed at New India Printing Press, Khurja, India